Analytics installation requirements and manual

Provision-ISR's IPC analytics supports a variety of analytics capabilities as follow:

Starting from v4.1:

1) Object monitoring (Missing object / Left items)
2) Camera tampering (Camera shifting / Lens tampering / Camera masking)
3) Line crossing
4) Sterile area

Starting from v4.2:

1) People intrusion
2) People counting
3) People gathering.

v4.3:

1) Face Detection

Below you will find a list of Provision-ISR's cameras and its analytics capabilities (If any):

S-Sight

2MP – No Analytics

3MP – No Analytics

4MP –Camera Tampering / Line Crossing / Sterile Area (No Object Monitoring)

4MP –Camera Tampering / Line Crossing / Sterile Area (No Object Monitoring)

X-Sight

2MP – No Analytics

Eye-Sight

2MP –Camera Tampering / Line Crossing / Sterile Area (No Object Monitoring)

4MP – Full Analytics

5MP – Full Analytics + Face Recognition

8MP – Full Analytics + Face Recognition

Dark-Sight

DAI/I4-251IP5VF – **No** Analytics

DAI/I4-251IP5VF**+** – **Full** Analytics

Special Solutions:

BX-251IP5 – Full Analytics + Face Recognition

DVS-IP5-4 – Camera Tampering / Line Crossing / Sterile Area / Object Monitoring.

FEI-360IP5 / MC-392IP543 – No Analytics

Devices with Ossia v1.1 - Camera Tampering / Line Crossing / Sterile Area / Object Monitoring.

Devices with Ossia 1.4 – Full Analytics

Face Recognition devices have additional support of Face Recognition.

Pre-installation requirements:

Please follow the requirements below to get the best analytics results:

1) Check the visibility, from the camera point of view.
2) Select the best place which covers the area you wish to protect.
3) Connect the camera to a stable base. Shaking and vibrations reduces accuracy and might generate false alarms.
4) Avoid reflective surface areas, such as shiny floor or mirrors.
5) Select bright area with different background colors than the objects colors.
6) The camera height depends on the actual focal length of the lens.

Lens	Mounting Height
2.8mm	2.6 ~ 3.2m
3.6mm	3.3 ~ 5.0m

Now we will go to specific installation requirements for each of the analytics capabilities:

Object Monitoring

(missing object / left item)

Object Monitoring Analytics can work in one of two methods, Missing Item and Left Item.

Missing item will detect if the marked item was moved or taken while left item will detect if an item was left behind in a defined area.

Configuration requirements:

1. The object size should be 1/50 up to 1/3 of the **whole** scene.
2. The defined area should preferably be less crowded and motionless.
3. Missing object settings requires to draw the object frame borders very tight to the object.
   This will increase the detection sensitivity and accuracy.

Proper and improper configurations

High Traffic Scene – Not recommended

Correct Installation

General Remarks:

1. The Analytics can be set to either Missing Object **or** Left Item. Both cannot work together.
2. The identification time for the object missing or left item is between 3 to 5 seconds.

3. Missing object or left item can be repeated for up to 4 deferent areas. All the rules and requirement are the same.

Camera Tampering

(Camera shifting / Lens tampering / Camera masking)

This Analytics is designed to detect physical damage to the camera that might prevent it from protecting its designated area. It will alert against any changes that occurred in the camera after its initial installation and include:

1. Camera shifting: In case the camera was forcibly moved out of place so it wouldn't cover the required area.
2. Camera Masking: Detects if the camera was covered or tampered in a way that blocks its view.
3. Lens Tampering: Detects lens tampering causing blurred image.

Configuration requirements:

There are no special requirements for the camera tampering analytics

Line Crossing

Detects if an object crossed a defined line. The crossing direction can be adjusted from each side of the line or from both sides.

Configuration requirements:

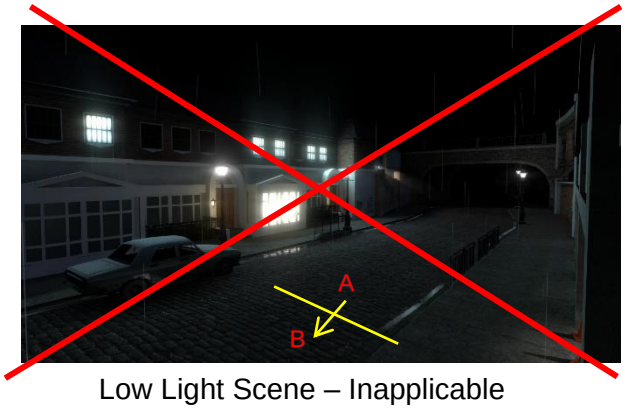
1. Select a bright area. Avoid constantly moving objects such as trees and scenes with many lighting changes.
2. The detection area should be well lighted and bright.
3. Install the camera at a height of 2.8 meters and more from the ground.
4. Install the camera at an angle of about 45 degrees from the ground.
5. The smallest detected object size shall not be smaller than 1 percent of the total scene.
6. The largest detected object size shall not be larger than 1/8 of the total scene.
7. **Make sure** that the object is displayed for at least two seconds for precise identification.

General Remarks:

1. Up to 4 lines can be set. Each line can be set with different configuration.

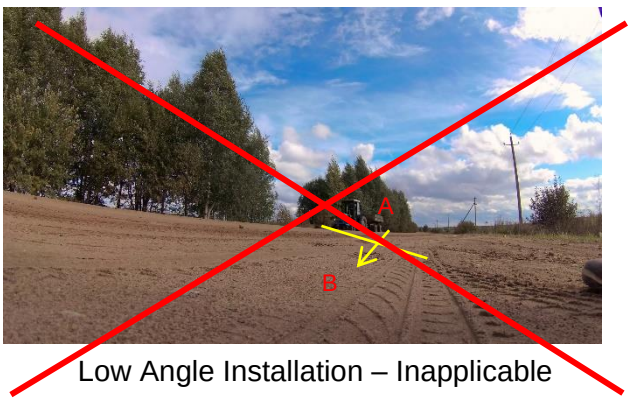
Inapplicable Scenes

1. Low Light Scenes.
2. Area with a lot of movements.
3. Area with frequently changing or uneven lights.
4. Low installation angle.

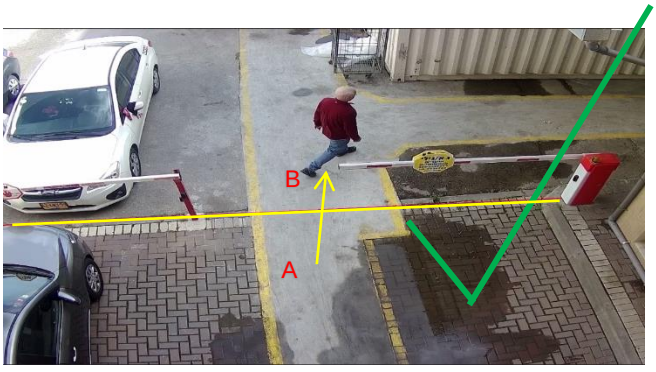


Low Light Scene – Inapplicable

Area with many movements – Inapplicable



Low Angle Installation – Inapplicable



Correct Installation

People Intrusion and Sterile Area

This function is designed to use indoors. It is mainly used to detect motion in a protected area.

The alarm will be triggered within 3 up to 5 sec if someone enters into the detected area.

Configuration requirements:

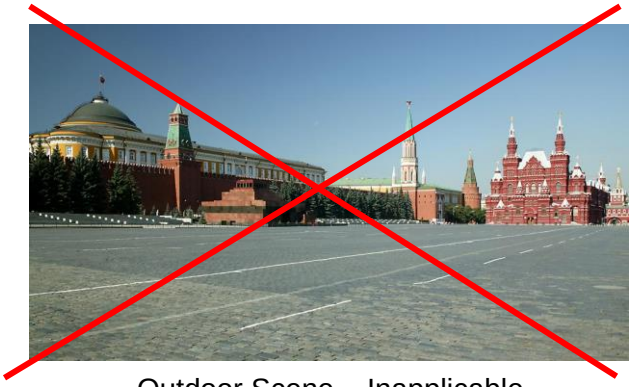
1. The defined area should be located under stable and uniformed lighting.
2. The camera must be installed at a height of 1 meter to 3 meters.
3. It is advised that the camera should be installed in the corner of the room.
4. The size of people/objects should be from 1/5 to 1/2 of the entire scene.
5. The defined area should preferably be less crowded and motionless.

General Remarks:

1. It is possible to define 4 different areas. The rules and requirements are the same.

Inapplicable Scenes

1. Outdoor Scenes.
2. Area with a lot of movements.
3. Area with frequently changing or uneven lights



Outdoor Scene – Inapplicable

High Traffic Scene – Inapplicable

Correct installation

People Counting

The function is used to count the number of people entering and exiting through a defined opening for tracking and counting purposes. The counter includes the number of people entering and leaving and automatically calculates the number of people staying in the area.

First, you should refer to the web client of the camera (config-analytics-people counting) and set the threshold values of entering people, exiting people and staying people.

The default value is 500, the maximum value is 655350. Once one of the threshold values is crossed, the camera will trigger an alarm.

Number of Entering People	500
Number of Exiting People	500
Number of Staying People	500

When people go through the defined area, the identification time will take 1 to 5 seconds due to various reasons.

Configuration requirements

1. Location: Cameras should be installed in the area of the opening where the people will pass.
2. Background: The background floor color recommended as bright color and preferable not glossy.
3. Angle installation: The lens of the camera will be adjusted “straight down” allowing some gradient but it should be noted that each “head shape” must be seen by the camera.
4. Height: The camera height of installation depends on the actual focal length of the lens. The main passage of the people flow will take more than half of the width for whole image. The person head will be about 1/5 of the height of the entire image. reserving space on both sides and turns the passage into a straight line with the center of the entire picture.

See the below table.

Lens	Mounting height
2.8mm	2.6 ~ 3.2m
3.3mm	3.0 ~ 4.0m
3.6mm	3.3 ~ 5.0m

5. Environment: stable and bright light without unnecessary movements such as trees etc.

Area Drawing requirement:

1) The detection area drown as a “blue box” should be larger than the corridor width, leave a certain distance from the edge of the image. (the undetected area width will be 4% ~10% of the entire image).
2) The person head size (width or height) should be about 1/5 ~ 1/2 of the detection area size.
3) The red orientation arrow should be from outside the box into the “Entrance”.
4) The Red Arrow direction is the "Entry" direction. The opposite direction. The opposite is the "Exit".

Inapplicable Scenes

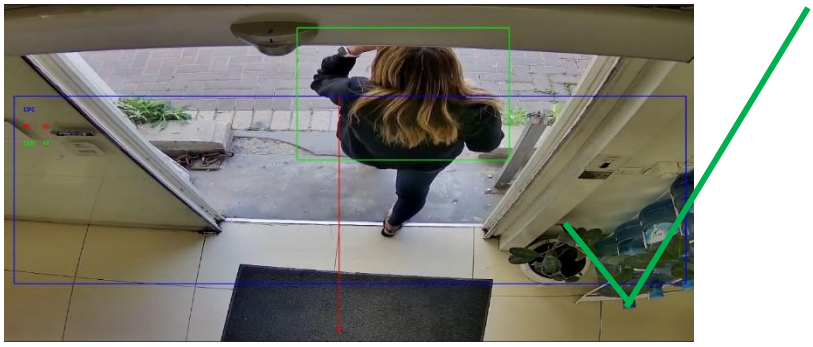
1. More than two directions of people flow
2. Unstable light source and Low Light Scenes.
3. Dark background (dark floor / carpet etc.).

The following conditions might work with reduced accuracy.

1. Light conditions: light should be bright and stable
2. Floor: the color of the floor, it is the background of the scene, should be bright
3. Camera height: the camera should be installed according to the information in the mentioned table.
4. Speed of movement: if the people passes the “blue box” in less than 2 seconds, it may cause a count error. If the image is moving at a slower rate than 15 seconds in the detection area, the camera will not detect and count.
5. Figures: if the colors of the person clothing resemble the background color, this may cause an error in identification.
6. Head appearance: Concealed “head shape” might lead to detection failure.

Dark / Glossy Floor – Inapplicable

Dark Scene – Inapplicable



Correct installation

People Gathering:

This function identifies the density level of the people in a defined area.
First set the density and predefined threshold level on the camera web interface.
When the density of people moving in the defined area exceeds the predefined threshold, the camera will generate an alarm. The detection intervals are 5-10seconds.

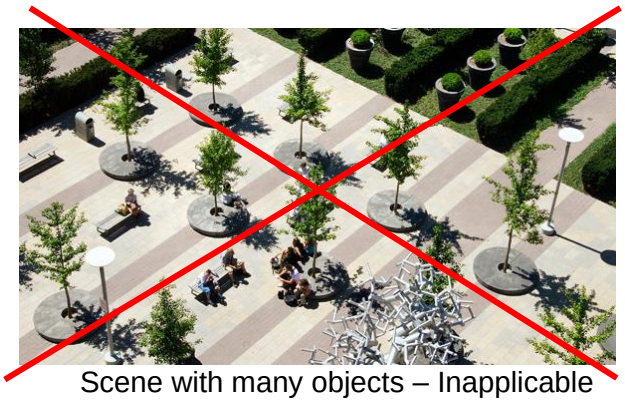
Configuration requirements

1. Light sources: bright and stable light sources are required.
   (low contrast and dark environments can impair the detection).
2. Visible area: people should be completely visible in the defined area.
3. Camera angle: the viewing direction of the camera should be in the direction of the people flow and preferably at an angle smaller than 45 ° in front of the horizon. The recommended angle between the camera lens and the floor will be between 30 ° and 60 °
4. Camera height: A single person in the scene should occupy between 1% and 5% of the entire scene.

Inapplicable Scenes

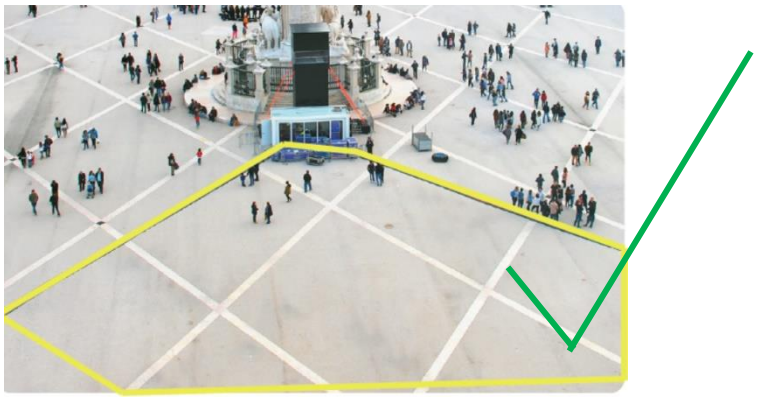
1. Area with trees and large moving objects.
2. Various changeable and unstable light sources.
3. Area with many moving objects in addition to people.

Note: This function cannot calculate the crowd numbers



Scene with many objects – Inapplicable

Moving Objects other than people – Inapplicable



Correct Installation

Face Detection/Recognition:

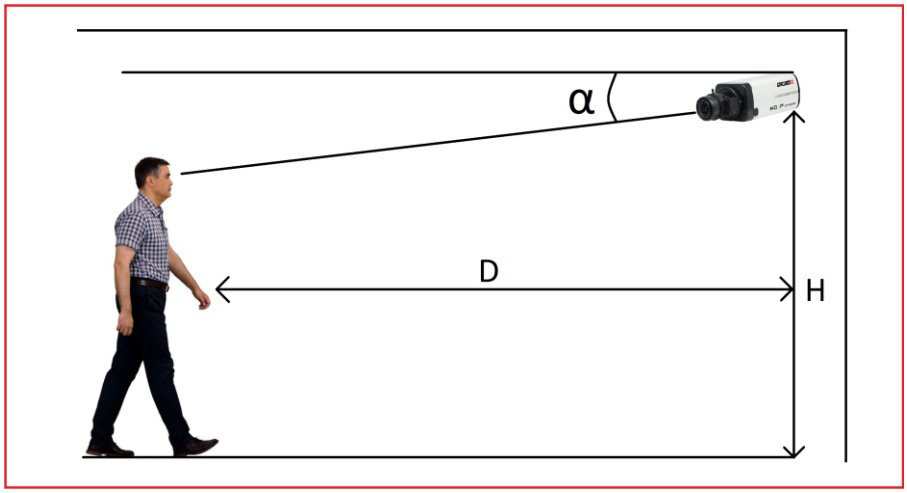
The Face Recognition platform is based on 2 components:

1) Analytics camera with “Face Detection”.
2) Recording device with "Face Recognition".

The face recognition allows to easily detect and recognize a person in the scene within a defined area. The recognition rate can be up to 98% if the distance between two pupils is greater than 20 pixels. A maximum of 10,000 face images can be stored in the NVR's face database. The NVR supports several triggers and responses after detection/recognition.

Configuration requirements

1) **Direction:** The camera should be installed in front of the walking lane and capture the face straight front.
2) **Light sources:** bright and stable light sources are required. Faces must be properly lit.
3) **Visible area:** All the face should be visible in the frame
4) **Camera angle:** camera angle from the ceiling (α) should be lower or equal to 15°
5) **Camera height:** Height (H) should be 2.0~3.5m according to the lens focal length and other requirements.
6) **Face Position:** Face angle from the camera (Left/Right) should be less than 30°. Pitch angle (Up/Down) should be less than 20°
7) **Night Mode:** B&W recognition will be supported in Ossia v1.4.1. In general, the B&W recognition rate is 20% lower than daytime.



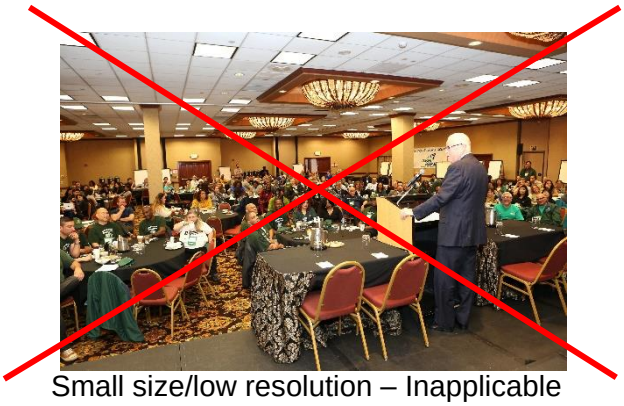
Factors Reducing Recognition Factors:

1) **Obstructed Face Features:** Faces with covered features or people wearing sunglasses, hats and masks will result in poor recognition, if any.
2) **Low Resolution:** Low Resolution faces reduces the algorithm efficiency and therefore the recognition accuracy.
3) **Low Brightness:** Dark scene/Face features dramatically reduces the recognition efficiency. If needed. Use BLC/HLC/HWDR in order to improve the image.
4) **Face Angle:** Face should be straight forward to the camera. Any rotation or tilt reduces recognition efficiency.

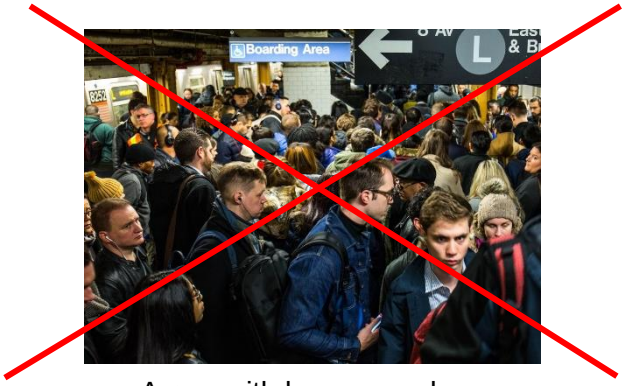
Inapplicable Scenes

1. Dark/Backlit Scene
2. Scene with small size/low resolution faces
3. Areas with large crowds

Dark/Backlit Scene – Inapplicable



Small size/low resolution – Inapplicable



Areas with large crowds

Proper installation.